Community-Driven Implementation: Reverse Osmosis Point-of-Use Case Study in Monson, CA

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Outline

- Monson profile
- Project background
- Water use /perception before filters
- Implementation process
- Ongoing O&M challenges
- Benefits of RO POU
- Limitations of RO POU
- Lessons Learned
- Impact

Monson

Photo: Mark Crosse, “Impoverished town of Monson getting water filters,” Fresno Bee, 09/16/2012.

Monson profile

- Small, unincorporated, rural community in Tulare county
- Surrounded by dairy farms and agricultural fields, has sandy soil
- Primarily Latino farmworkers or retirees
- Population (US Census 2010)
  - 49 households
  - 188 people
- All houses on private wells and septic systems
- Contaminants: nitrates (up to 5x MCL), bacteria, DBCP

Project background

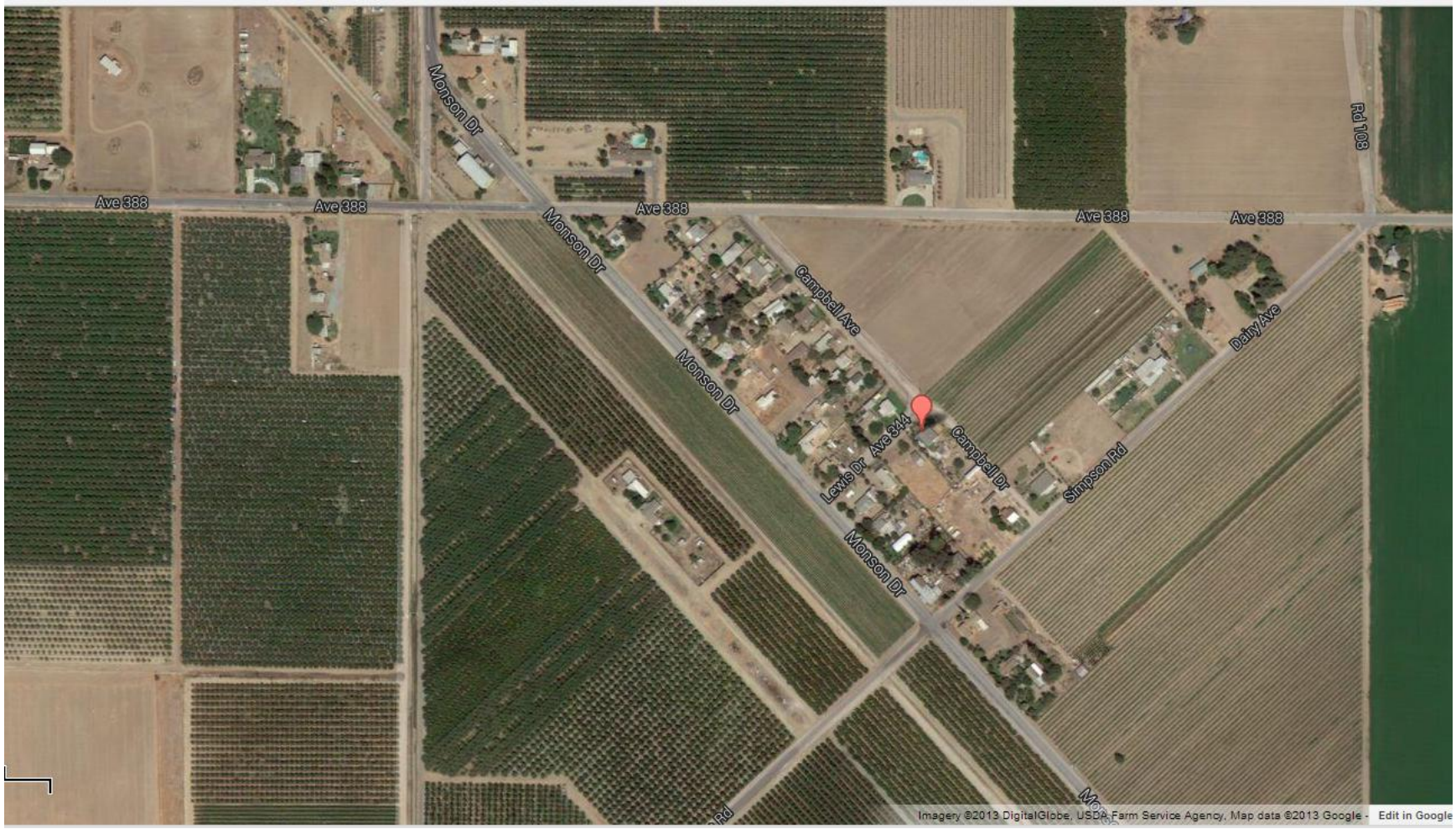
- 2008
  - Monson community residents identify water quality concerns, formed La Voz de Monson
  - CWC and Self Help Enterprises help secure resources for free water testing of wells
    - Nitrates can be 3x MCL (45 mg/L)
  - La Voz de Monson, CWC, Self Help, County explored long-term solution options
    - Face many technical delays from existing state funding mechanisms

Project background

- 2012
  - Local Rotary Clubs help fundraise $15K for a short-term interim solution
  - POU filter project begins in Oct. (outreach and installation, water testing)

- 2013
  - POU filter projects ends in June (installations)
  - Ongoing operations and maintenance (O&M) and water testing monitoring

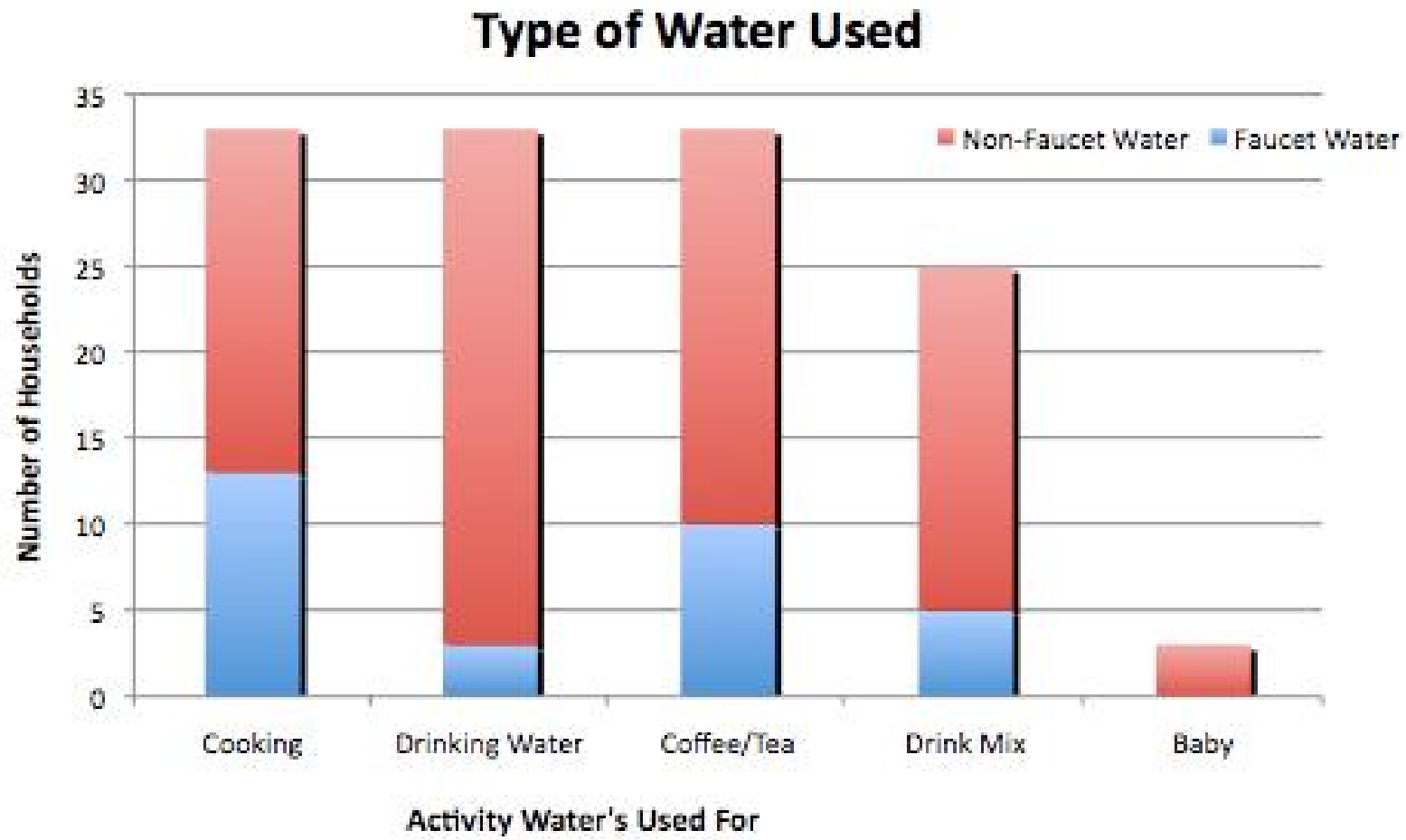
Aerial map of Monson



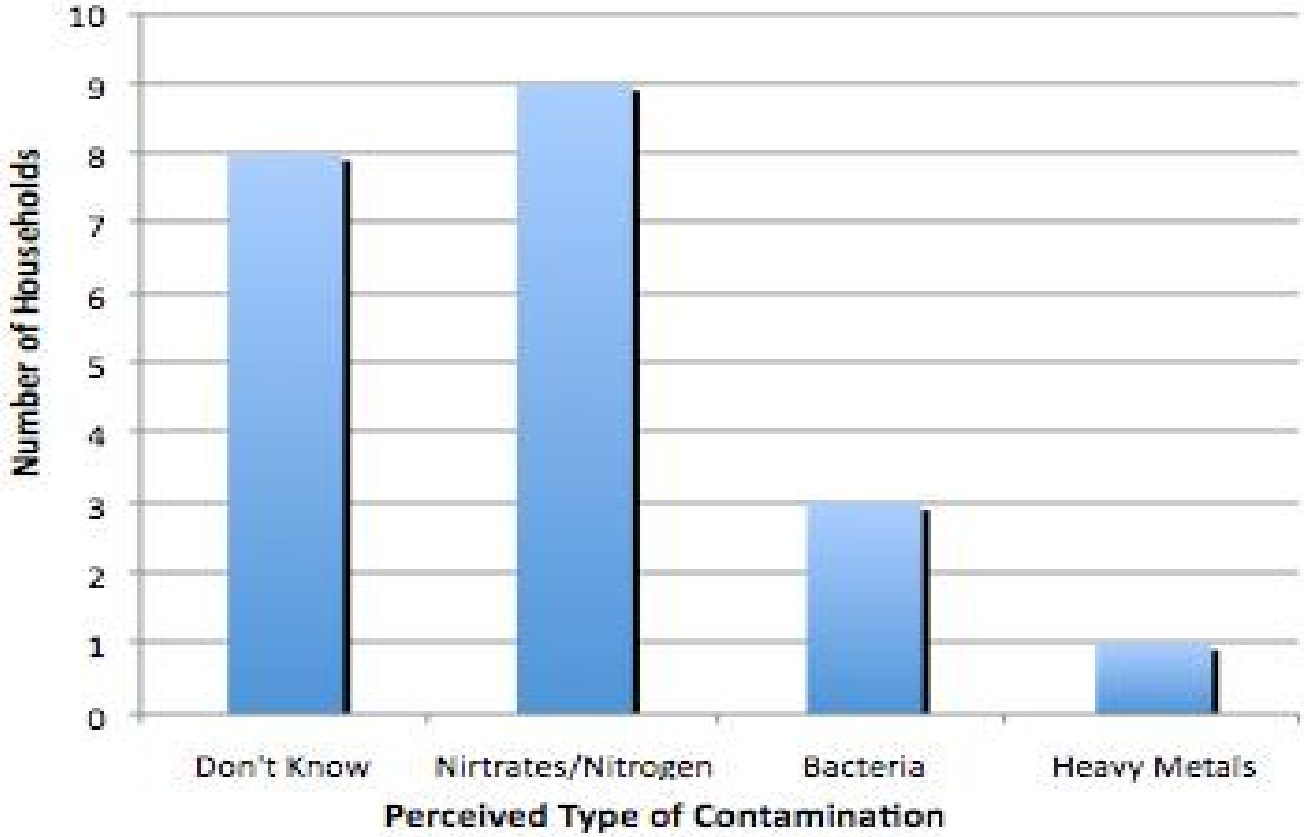
Water use before filters

Photo: Max Whittaker, “Why Federal Efforts to Ensure Clean Tap Water Fail to Reach Faucets Nationwide,” The New York Times, 05/10/2013.

Water use before filters



Perception of water quality



Note: 19 households believe their water is contaminated. The number of responses is more than 19 since residents were allowed to choose more than one option.

Implementation process

- Community outreach meetings and door-to-door: buy-in
  - Contacted 41 households
  - Installed in 29 houses
  - Other houses: plumbing issues, not interested, not available
- Pre-installation inspections of homes
- Installation team: Rotarian volunteers, plumbers, CWC staff
- Water quality monitoring by CWC and Rotary, in-kind support by Cal Water
- Evaluation: pre and post filter installation surveys
- Education: O&M, well disinfection

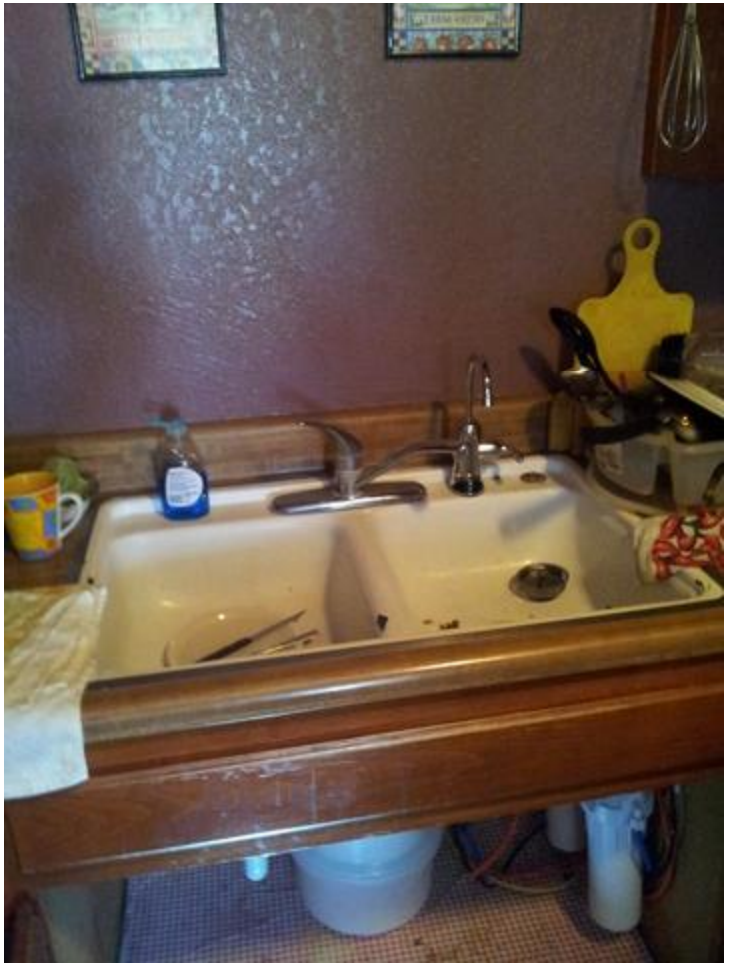
Filter system costs

- GE Reverse Osmosis Filtration System (GXRM10RBL): $149
- Replacement filters: $45 (x2 a year)
- Replacement membrane: $54 (2-3 years)
- Certified by NSF/ANSI 58 and CDPH
- Available in Home Depot

Community outreach

Installations

Installations



Education – proper O&M

Education – well disinfection

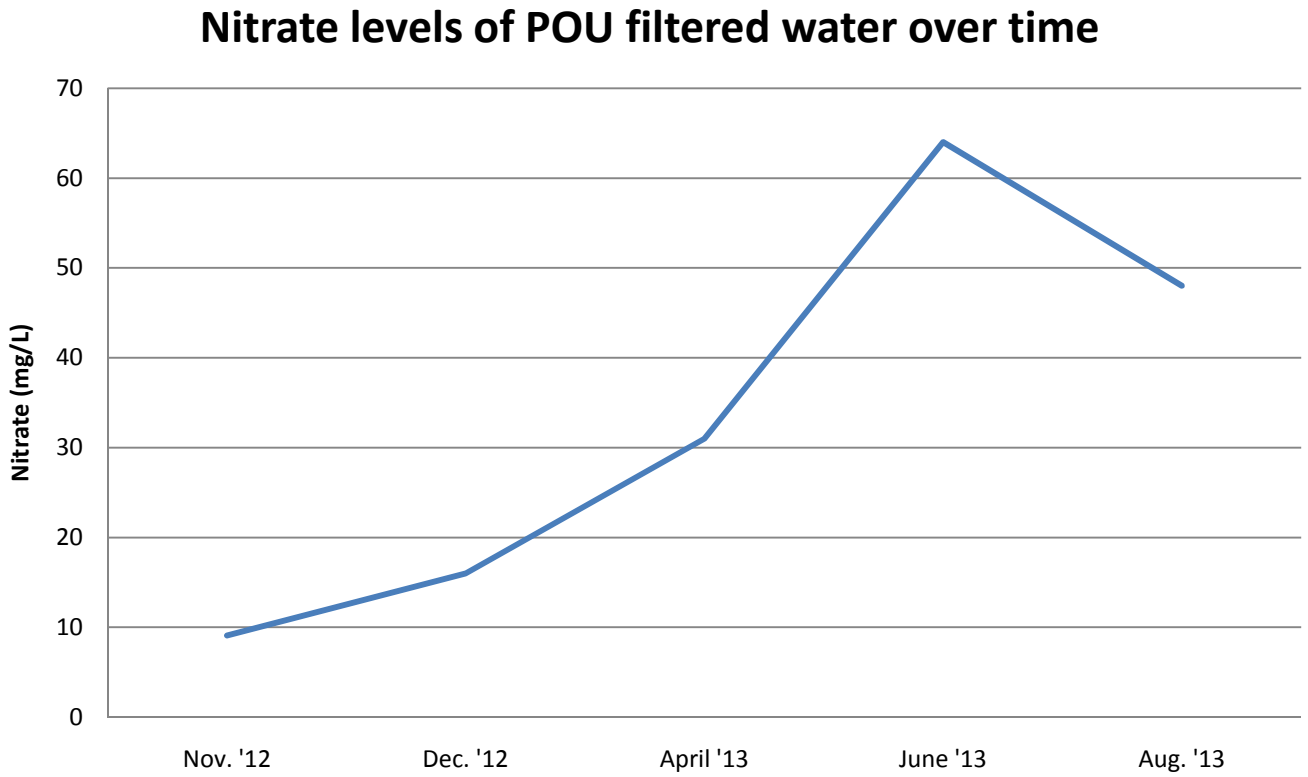
Evaluation

Raw water vs. Filtered water

6 families installed in Oct. ‘12, samples taken in Nov. ‘12.

Raw water (mg/L)	Filtered water (mg/L)
85	9.1
39	0
100	7.4
56	1.4
50	0
110	19

Filter performance over time



85 mg/L in raw water sampled in Nov ‘12.

*Change filters every 6 months – recommended by manufacturer

Ongoing O&M challenges

Benefits of RO POU

- Pros
  - Affordable and cost effective
  - Parts available locally
  - Reduces TDS levels – better taste
  - Don’t have to buy water
  - Don’t have to travel to get water

NSF RO POU limitations

- Monitoring is typically all on burden of consumer
- Performance indicator light tied to water quality – very expensive
  - TDS monitor as surrogate?
  - Light is reminder to change replacement pre and post cartridges or 500 gal dispensed
- Certified levels up to 120 mg/L as nitrate

Lessons learned

- Community driven project with supportive community base crucial
- Regular O&M and monitoring follow-up necessary
- Many logistical challenges, but can be an effective interim solution
- Limitations of RO POU technology – user side

Impact

- **Before Filter**: "Maybe if we catch it now, our children will benefit from it," said Tony Torres. "I think it’s great."

- **After filter**: "I'm really glad this project did this for us because it makes me feel safer about drinking tap water. Before, I didn't feel safe drinking it so I would buy bottled water"

Thank you!